



STAVRIANOPOULOS ET AL., U.S. PAT. APPL. SER. NO. 08/486,070

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718. (NEW) A solid support comprising an array of substrate surfaces, each substrate surface comprising at least one double-stranded nucleic acid fixed or immobilized thereto, wherein at least one nucleic acid strand or a sequence therefrom comprises one or more non-radioactive chemical labels which comprise a non-radioactive signaling moiety or moieties which are quantifiable or detectable, and wherein at least one nucleic acid strand or a sequence therefrom in one of said substrate surfaces is different from at least one other nucleic acid strand or a sequence therefrom in another substrate surface.

719. (NEW) The solid support of claim 718, wherein said solid support is selected from the group consisting of a porous solid support and a non-porous solid support.

720. (NEW) The solid support of claim 719, wherein said porous solid support comprises a porous polymeric material.

721. (NEW) The solid support of claim 720, wherein said porous polymeric material is selected from the group consisting of dextran and nitrocellulose.

722. (NEW) The solid support of claim 720, wherein said porous polymeric material comprises porous glass.

723. (NEW) The solid support of claim 719, wherein said non-porous solid support is selected from the group consisting of siliceous matter and non-porous polymeric material.

724. (NEW) The solid support of claim 723, wherein said siliceous matter comprises glass or a glass-coated surface.

725. (NEW) The solid support of claim 724, wherein said glass or glass-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

726. (NEW) The solid support of claim 725, wherein said wells comprise microtiter wells.

727. (NEW) The solid support of claim 723, wherein said non-porous polymeric material comprises a plastic or plastic-coated surface.

728. (NEW) The solid support of claim 727, wherein said plastic or plastic-coated surface is selected from the group consisting of polyethylene, polypropylene, polystyrene and polyepoxide.

729. (NEW) The solid support of claim 727, wherein said plastic or plastic-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

730. (NEW) The solid support of claim 729, wherein said wells comprise microtiter wells.

731. (NEW) The solid support of claim 718, wherein said substrate surface or surfaces have been treated with a surface treatment agent.

732. (NEW) The solid support of claim 731, wherein said surface treatment agent is selected from the group consisting of an amine compound and an epoxy compound.

733. (NEW) The solid support of claim 732, wherein said surface treatment agent comprises an amine compound.

734. (NEW) The solid support of claim 733, wherein said amine compound is selected from the group consisting of duodecadiamine (DDA), polylysine (PPL), γ -aminopropyltriethoxysilane, ammonium acetate and a combination of any of the foregoing.

735. (NEW) The solid support of claim 732, wherein said surface treatment agent comprises an epoxy compound.

736. (NEW) The solid support of claim 718, wherein said at least one nucleic acid strand or a sequence therefrom has been fixed or immobilized to said substrate surface or surfaces by a means selected from the group consisting of an amine compound and an epoxy compound.

737. (NEW) The solid support of claim 718, wherein said at least one nucleic acid strand or a sequence therefrom has been fixed or immobilized directly or indirectly to said substrate surface or surfaces.

738. (NEW) The solid support of claim 718, wherein one strand of each of said double-stranded nucleic acid strands is fixed or immobilized directly or indirectly to said substrate surface or surfaces.

739. (NEW) The solid support of claim 718, wherein said double-stranded nucleic acid strands are fixed or immobilized to said substrate surfaces by sandwich hybridization.

740. (NEW) The solid support of claim 718, wherein said nucleic acid strands are selected from the group consisting of single-stranded nucleic acid, double-stranded nucleic acid and partially double-stranded nucleic acid.

741. (NEW) The solid support of claim 718, wherein said nucleic acid strands are selected from the group consisting of DNA, RNA and a DNA-RNA hybrid.

742. (NEW) The solid support of claim 718, wherein said at least one nucleic acid strand or a sequence therefrom comprises a nucleic acid sequence complementary to a nucleic acid sequence of interest or sought to be identified or quantified or sequenced.

743. (NEW) The solid support of claim 742, wherein said nucleic acid sequence of interest or sought to be identified or quantified or sequenced comprises a member selected from the group consisting of a gene or gene sequence, a pathogen or pathogenic sequence, an oncogene, and a combination of any of the foregoing.

744. (NEW) The solid support of claim 743, wherein any of said members comprises a mutation selected from the group consisting of a deletion, an insertion, an inversion, a point mutation, and a combination of any of the foregoing.

745. (NEW) The solid support of claim 742, wherein said complementary nucleic acid sequence or sequences are unlabeled.

746. (NEW) The solid support of claim 718, wherein said non-radioactive chemical label or labels are the non-radioactive signaling moiety or moieties.

747. (NEW) The solid support of claim 718, wherein said non-radioactive chemical label or labels comprise a non-radioactive signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said solid support or said substrate surfaces or a system or collection or set containing said array or said substrate surfaces, said quantity being proportional to the amount or quantity of said label or labels.

748. (NEW) The solid support of claim 746, wherein said non-radioactive chemical label or labels comprise a non-radioactive signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said solid support or said substrate surfaces or a system or collection or set containing said array or said substrate surfaces, said quantity being proportional to the amount or quantity of said label or labels.

749. (NEW) The solid support of claim 718, wherein said non-radioactive chemical label or labels are attached covalently to said at least one nucleic acid strand or a sequence therefrom.

750. (NEW) The solid support of claim 746, wherein said non-radioactive chemical label or labels are attached covalently to said at least one nucleic acid strand or a sequence therefrom.

751. (NEW) The solid support of claim 718, wherein said non-radioactive chemical label or labels are attached directly or indirectly to said at least one nucleic acid strand or a sequence therefrom.

752. (NEW) The solid support of claim 746, wherein said non-radioactive chemical label or labels are attached directly or indirectly to said at least one nucleic acid strand or a sequence therefrom.

753. (NEW) The solid support of claim 751, wherein said direct or indirect attachment is through one or more nucleotides in said at least one nucleic acid strand or a sequence therefrom.

754. (NEW) The solid support of claim 752, wherein said direct or indirect attachment is through one or more nucleotides in said at least one nucleic acid strand or a sequence therefrom.

755. (NEW) The solid support of claim 753, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

756. (NEW) The solid support of claim 754, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

757. (NEW) The solid support of claim 755, wherein said bridging entity or complex is covalently or non-covalently attached.

758. (NEW) The solid support of claim 756, wherein said bridging entity or complex is covalently or non-covalently attached.

759. (NEW) The solid support of claim 757, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

760. (NEW) The solid support of claim 758, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

761. (NEW) The solid support of claim 718, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are covalently or non-covalently attached thereto.

762. (NEW) The solid support of claim 718, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are directly attached thereto.

763. (NEW) The solid support of claim 718, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are indirectly attached thereto.

764. (NEW) The solid support of claim 718, wherein said non-radioactive chemical label or labels comprise indicator molecules.

765. (NEW) The solid support of claim 764, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

766. (NEW) The solid support of claim 746, wherein said non-radioactive chemical label or labels comprise indicator molecules.

767. (NEW) The solid support of claim 766, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

768. (NEW) The solid support of claim 718, wherein a quantifiable or detectable non-radioactive signal is generated or generatable directly or indirectly from said non-radioactive signaling moiety or moieties.

769. (NEW) The solid support of claim 746, wherein a quantifiable or detectable non-radioactive signal is generated or generatable directly or indirectly from said non-radioactive chemical label or labels.

770. (NEW) The solid support of 718, wherein said non-radioactive signaling moiety or moieties are directly produced.

771. (NEW) The solid support of claim 770, wherein said directly produced non-radioactive signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

772. (NEW) The solid support of 718, wherein said non-radioactive signaling moiety or moieties are indirectly produced.

773. (NEW) The solid support of claim 772, wherein said non-radioactive signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

774. (NEW) The solid support of claim 773, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

775. (NEW) The solid support of 746, wherein said non-radioactive signaling moiety or moieties are directly produced.

776. (NEW) The solid support of claim 775, wherein said directly produced non-radioactive signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

777. (NEW) The solid support of 746, wherein said non-radioactive signaling moiety or moieties are indirectly produced.

778. (NEW) The solid support of claim 777, wherein said non-radioactive signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

779. (NEW) The solid support of claim 778, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

780. (NEW) The solid support of claim 718, wherein said non-radioactive signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagenic compound, a fluorescent compound and a chemiluminescent compound.

781. (NEW) The solid support of claim 746, wherein said non-radioactive signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagen compound, a fluorescent compound and a chemiluminescent compound.

782. (NEW) The solid support of claim 718, wherein a non-radioactive signal is generated or generatable from said non-radioactive chemical label or labels by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

783. (NEW) The solid support of claim 746, wherein a non-radioactive signal is generated or generatable from said non-radioactive chemical label or labels by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

784. (NEW) The solid support of claim 718, wherein said non-radioactive chemical label or labels are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

785. (NEW) The solid support of claim 746, wherein said non-radioactive chemical label or labels are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

786. (NEW) The solid support of claim 784, wherein said colored compound comprises a dye.

787. (NEW) The solid support of claim 785, wherein said colored compound comprises a dye.

788. (NEW) The solid support of claim 718, wherein a non-radioactive signal from said non-radioactive signaling moiety or moieties is quantifiable or detectable by photometric means.

789. (NEW) The solid support of claim 746, wherein a non-radioactive signal from said non-radioactive signaling moiety or moieties is quantifiable or detectable by photometric means.

790. (NEW) The solid support of claim 788, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

791. (NEW) The solid support of claim 789, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

792. (NEW) The solid support of claim 718, wherein said solid support is transparent or translucent.

793. (NEW) The solid support of claim 719, wherein said solid support is transparent or translucent.

794. (NEW) A collection or set comprising the solid support of any of claims 718 to 793.

795. (NEW) A collection or set comprising the solid support of claim 718, wherein said solid supports are porous.

796. (NEW) A collection or set comprising the solid support of claim 718, wherein said solid supports are non-porous.

797. (NEW) The collection or set of claim 796, wherein said non-porous solid supports are transparent or translucent.

798. (NEW) A non-porous system for retaining or containing a fluid or solution, which system comprises the solid support of any of claims 718-793.

799. (NEW) A non-porous system for retaining or containing a fluid or solution, which system comprises a collection or set of any of the solid supports of claims 718-793.

800. (NEW) A non-porous solid support comprising an array of substrate surfaces, each substrate surface comprising at least one nucleic acid strand fixed or immobilized thereto, and wherein at least one nucleic acid strand or a sequence therefrom in one of said substrate surfaces is different from at least one other nucleic acid strand or a sequence therefrom in another substrate surface.

801. (NEW) The solid support of claim 800, wherein said non-porous solid support is selected from the group consisting of siliceous matter and non-porous polymeric material.

802. (NEW) The solid support of claim 801, wherein said siliceous matter comprises glass or a glass-coated surface.

803. (NEW) The solid support of claim 802, wherein said glass or glass-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

804. (NEW) The solid support of claim 803, wherein said wells comprise microtiter wells.

805. (NEW) The solid support of claim 801, wherein said non-porous polymeric material comprises a plastic or plastic-coated surface.

806. (NEW) The solid support of claim 805, wherein said plastic or plastic-coated surface is selected from the group consisting of polyethylene, polypropylene, polystyrene and polyepoxide.

807. (NEW) The solid support of claim 805, wherein said plastic or plastic-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection of said plates, wells, depressions, tubes or cuvettes.

808. (NEW) The solid support of claim 807, wherein said wells comprise microtiter wells.

809. (NEW) The solid support of claim 800, wherein said substrate surface or surfaces have been treated with a surface treatment agent.

810. (NEW) The solid support of claim 809, wherein said surface treatment agent is selected from the group consisting of an amine compound and an epoxy compound.

811. (NEW) The solid support of claim 810, wherein said surface treatment agent comprises an amine compound.

812. (NEW) The solid support of claim 811, wherein said amine compound is selected from the group consisting of duodecadiamine (DDA), polylysine (PPL), γ -aminopropyltriethoxysilane, ammonium acetate and a combination of any of the foregoing.

813. (NEW) The solid support of claim 810, wherein said surface treatment agent comprises an epoxy compound.

814. (NEW) The solid support of claim 800, wherein said at least one nucleic acid strand or a sequence therefrom has been fixed or immobilized to said substrate surface or surfaces by a means selected from the group consisting of an amine compound and an epoxy compound.

815. (NEW) The solid support of claim 800, wherein said at least one nucleic acid strand or a sequence therefrom has been fixed or immobilized directly or indirectly to said substrate surface or surfaces.

816. (NEW) The solid support of claim 800, wherein said nucleic acid strands are selected from the group consisting of single-stranded nucleic acid and partially double-stranded nucleic acid.

817. (NEW) The solid support of claim 800, wherein said nucleic acid strands are selected from the group consisting of DNA and RNA.

818. (NEW) The solid support of claim 800, wherein said at least one nucleic acid strand or a sequence therefrom comprises a nucleic acid sequence complementary to a nucleic acid sequence of interest or sought to be identified or quantified or sequenced.

819. (NEW) The solid support of claim 818, wherein said nucleic acid sequence of interest or sought to be identified or quantified or sequenced comprises a member selected from the group consisting of a gene or gene sequence, a pathogen or pathogenic sequence, an oncogene, and a combination of any of the foregoing.

820. (NEW) The solid support of claim 819, wherein any of said members comprises a mutation selected from the group consisting of a deletion, an insertion, an inversion, a point mutation, and a combination of any of the foregoing.

821. (NEW) The solid support of claim 818, wherein said nucleic acid sequence of interest or sought to be identified or quantified or sequenced comprises one or more non-radioactive chemical labels which comprise a non-radioactive signaling moiety or moieties which are quantifiable or detectable.

822. (NEW) The solid support of claim 821, wherein said non-radioactive chemical label or labels are the non-radioactive signaling moiety or moieties.

823. (NEW) The solid support of claim 821, wherein said non-radioactive chemical label or labels comprise a non-radioactive signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said solid support or said substrate surfaces or a system or collection or set containing said array or said substrate surfaces, said quantity being proportional to the amount or quantity of said label or labels.

824. (NEW) The solid support of claim 822, wherein said non-radioactive chemical label or labels comprise a non-radioactive signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said solid support or said substrate surfaces or a system or collection or set containing said array or said substrate surfaces, said quantity being proportional to the amount or quantity of said label or labels.

825. (NEW) The solid support of claim 821, wherein said non-radioactive chemical label or labels are attached covalently to said at least one nucleic acid strand or a sequence therefrom.

826. (NEW) The solid support of claim 822, wherein said non-radioactive chemical label or labels are attached covalently to said at least one nucleic acid strand or a sequence therefrom.

827. (NEW) The solid support of claim 821, wherein said non-radioactive chemical label or labels are attached directly or indirectly to said at least one nucleic acid strand or a sequence therefrom.

828. (NEW) The solid support of claim 822, wherein said non-radioactive chemical label or labels are attached directly or indirectly to said at least one nucleic acid strand or a sequence therefrom.

829. (NEW) The solid support of claim 827, wherein said direct or indirect attachment is through one or more nucleotides in said at least one nucleic acid strand or a sequence therefrom.

830. (NEW) The solid support of claim 828, wherein said direct or indirect attachment is through one or more nucleotides in said at least one nucleic acid strand or a sequence therefrom.

831. (NEW) The solid support of claim 829, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

832. (NEW) The solid support of claim 830, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

833. (NEW) The solid support of claim 831, wherein said bridging entity or complex is covalently or non-covalently attached.

834. (NEW) The solid support of claim 832, wherein said bridging entity or complex is covalently or non-covalently attached.

835. (NEW) The solid support of claim 833, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

836. (NEW) The solid support of claim 834, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

837. (NEW) The solid support of claim 821, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are covalently or non-covalently attached thereto.

838. (NEW) The solid support of claim 821, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are directly attached thereto.

839. (NEW) The solid support of claim 821, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are indirectly attached thereto.

840. (NEW) The solid support of claim 821, wherein said non-radioactive chemical label or labels comprise indicator molecules.

841. (NEW) The solid support of claim 840, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

842. (NEW) The solid support of claim 822, wherein said non-radioactive chemical label or labels comprise indicator molecules.

843. (NEW) The solid support of claim 842, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

844. (NEW) The solid support of claim 821, wherein a quantifiable or detectable non-radioactive signal is generated or generatable directly or indirectly from said non-radioactive signaling moiety or moieties.

845. (NEW) The solid support of claim 822, wherein a quantifiable or detectable non-radioactive signal is generated or generatable directly or indirectly from said non-radioactive chemical label or labels.

846. (NEW) The solid support of 821, wherein said non-radioactive signaling moiety or moieties are directly produced.

847. (NEW) The solid support of claim 846, wherein said directly produced non-radioactive signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

848. (NEW) The solid support of 821, wherein said non-radioactive signaling moiety or moieties are indirectly produced.

849. (NEW) The solid support of claim 848, wherein said non-radioactive signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

850. (NEW) The solid support of claim 849, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

851. (NEW) The solid support of 822, wherein said non-radioactive signaling moiety or moieties are directly produced.

852. (NEW) The solid support of claim 851, wherein said directly produced non-radioactive signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

853. (NEW) The solid support of 822, wherein said non-radioactive signaling moiety or moieties are indirectly produced.

854. (NEW) The solid support of claim 853, wherein said non-radioactive signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

855. (NEW) The solid support of claim 854, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

856. (NEW) The solid support of claim 821, wherein said non-radioactive signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagenic compound, a fluorescent compound and a chemiluminescent compound.

857. (NEW) The solid support of claim 822, wherein said non-radioactive signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagen compound, a fluorescent compound and a chemiluminescent compound.

858. (NEW) The solid support of claim 821, wherein a non-radioactive signal is generated or generatable from said non-radioactive chemical label or labels by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

859. (NEW) The solid support of claim 822, wherein a non-radioactive signal is generated or generatable from said non-radioactive chemical label or labels by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

860. (NEW) The solid support of claim 821, wherein said non-radioactive chemical label or labels are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

861. (NEW) The solid support of claim 822, wherein said non-radioactive chemical label or labels are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

862. (NEW) The solid support of claim 860, wherein said colored compound comprises a dye.

863. (NEW) The solid support of claim 861, wherein said colored compound comprises a dye.

864. (NEW) The solid support of claim 821, wherein a non-radioactive signal from said non-radioactive signaling moiety or moieties is quantifiable or detectable by photometric means.

865. (NEW) The solid support of claim 822, wherein a non-radioactive signal from said non-radioactive chemical label or labels is quantifiable or detectable by photometric means.

866. (NEW) The solid support of claim 864, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

867. (NEW) The solid support of claim 865, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

868. (NEW) The solid support of claim 800, wherein said non-porous solid support is transparent or translucent.

869. (NEW) A collection or set comprising the non-porous solid supports of any of claims 800 to 868.

870. (NEW) A collection or set comprising the non-porous solid supports of claim 800, wherein said non-porous solid supports are transparent or translucent.

871. (NEW) A non-porous system for retaining or containing a fluid or solution, which system comprises the solid support of any of claims 800-868.

872. (NEW) A non-porous system for retaining or containing a fluid or solution, which system comprises a collection or set of any of the solid supports of claims 800-868.

873. (NEW) A composition of matter comprising:

 a transparent non-porous or translucent non-porous system containing a fluid or solution, which system comprises:

- (i) a solid support contained within said transparent non-porous or translucent non-porous system;
- (ii) a double-stranded oligonucleotide or polynucleotide which is directly or indirectly fixed or immobilized to said solid support;
- (iii) a chemical label or labels attached to one of said strands, said label or labels comprising a signaling entity or entities which are quantifiable in or from said fluid or solution or in or through said system, said quantity being proportional to the amount or quantity of said label or labels; and
- (iv) photometric means for quantifying said quantifiable signaling entity or entities.

874. (NEW) The composition of claim 873, wherein said transparent non-porous or translucent non-porous system is selected from the group consisting of siliceous matter and non-porous polymeric material.

875. (NEW) The composition of claim 874, wherein said siliceous matter comprises glass or a glass-coated surface.

876. (NEW) The composition of claim 875, wherein said glass or glass-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

877. (NEW) The composition of claim 876, wherein said wells comprise microtiter wells.

878. (NEW) The composition of claim 874, wherein said non-porous polymeric material comprises a plastic or plastic-coated surface.

879. (NEW) The composition of claim 878, wherein said plastic or plastic-coated surface is selected from the group consisting of polyethylene, polypropylene, polystyrene and polyepoxide.

880. (NEW) The composition of claim 878, wherein said plastic or plastic-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

881. (NEW) The composition of claim 880, wherein said wells comprise microtiter wells.

882. (NEW) The composition of claim 873, wherein said solid support (i) is selected from the group consisting of a porous solid support and a non-porous solid support.

883. (NEW) The composition of claim 882, wherein said porous solid support (i) comprises a porous polymeric material.

884. (NEW) The composition of claim 883, wherein said porous polymeric material is selected from the group consisting of dextran and nitrocellulose.

885. (NEW) The composition of claim 883, wherein said porous polymeric material comprises porous glass.

886. (NEW) The composition of claim 882, wherein said non-porous solid support (i) is selected from the group consisting of siliceous matter and non-porous polymeric material.

887. (NEW) The composition of claim 886, wherein said siliceous matter comprises glass or a glass-coated surface.

888. (NEW) The composition of claim 887, wherein said glass or glass-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

889. (NEW) The composition of claim 888, wherein said wells comprise microtiter wells.

890. (NEW) The composition of claim 886, wherein said non-porous polymeric material comprises a plastic or plastic-coated surface.

891. (NEW) The composition of claim 890, wherein said plastic or plastic-coated surface is selected from the group consisting of polyethylene, polypropylene, polystyrene and polyepoxide.

892. (NEW) The composition of claim 890, wherein said plastic or plastic-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

893. (NEW) The composition of claim 892, wherein said wells comprise microtiter wells.

894. (NEW) The composition of claim 882, wherein said non-porous solid support is transparent or translucent.

895. (NEW) The composition of claim 873, wherein said solid support (i) has been treated with a surface treatment agent.

896. (NEW) The composition of claim 895, wherein said surface treatment agent is selected from the group consisting of an amine compound and an epoxy compound.

897. (NEW) The composition of claim 895, wherein said surface treatment agent comprises an amine compound.

898. (NEW) The composition of claim 897, wherein said amine compound is selected from the group consisting of duodecadiamine (DDA), polylysine (PPL), γ -aminopropyltriethoxysilane, ammonium acetate and a combination of any of the foregoing.

899. (NEW) The composition of claim 896, wherein said surface treatment agent comprises an epoxy compound.

900. (NEW) The composition of claim 873, wherein at least one strand of said double-stranded oligonucleotide or polynucleotide (ii) is fixed or immobilized to said solid support (i) by a means selected from the group consisting of an amine compound and an epoxy compound.

901. (NEW) The composition of claim 873, wherein at least one strand of said double-stranded oligonucleotide or polynucleotide (ii) is fixed or immobilized directly or indirectly to said solid support (i).

902. (NEW) The composition of claim 873, wherein said double-stranded oligonucleotide or polynucleotide (ii) is fixed or immobilized to said solid support (i) by sandwich hybridization.

903. (NEW) The composition of claim 873, wherein said double-stranded oligonucleotide or polynucleotide (ii) is selected from the group consisting of double-stranded nucleic acid and partially double-stranded nucleic acid.

904. (NEW) The composition of claim 873, wherein said double-stranded oligonucleotide or polynucleotide (ii) is selected from the group consisting of DNA, RNA and a DNA-RNA hybrid.

905. (NEW) The composition of claim 873, wherein one strand of said double-stranded oligonucleotide or polynucleotide (ii) or a sequence therefrom comprises a nucleic acid sequence complementary to a nucleic acid sequence of interest or sought to be quantified.

906. (NEW) The composition of claim 905, wherein said nucleic acid sequence of interest or sought to be identified or quantified or sequenced comprises a member selected from the group consisting of a gene or gene sequence, a pathogen or pathogenic sequence, an oncogene, and a combination of any of the foregoing.

907. (NEW) The composition of claim 906, wherein any of said members comprises a mutation selected from the group consisting of a deletion, an insertion, an inversion, a point mutation, and a combination of any of the foregoing.

908. (NEW) The composition of claim 905, wherein said complementary nucleic acid sequence or sequences are unlabeled.

909. (NEW) The composition of claim 873, wherein said chemical label or labels (iii) are the signaling moiety or moieties.

910. (NEW) The composition of claim 873, wherein said chemical label or labels (iii) comprise a signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said system or said solid support (i) or a collection or set of said solid supports (i), said quantity being proportional to the amount or quantity of said label or labels.

911. (NEW) The composition of claim 909, wherein said chemical label or labels (iii) comprise a signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said system or said solid support (i) or a collection or set of said solid supports (ii), said quantity being proportional to the amount or quantity of said label or labels.

912. (NEW) The composition of claim 873, wherein said chemical label or labels (iii) are attached covalently to at least one strand of said double-stranded oligonucleotide or polynucleotide (ii) or a sequence therefrom.

913. (NEW) The composition of claim 909, wherein said chemical label or labels (iii) are attached covalently to at least one strand of said double-stranded oligonucleotide or polynucleotide (ii) or a sequence therefrom.

914. (NEW) The composition of claim 873, wherein said chemical label or labels (iii) are attached directly or indirectly to said one strand of said double-stranded oligonucleotide or polynucleotide (ii) or a sequence therefrom.

915. (NEW) The composition of claim 909, wherein said chemical label or labels (iii) are attached directly or indirectly to said one strand of said double-stranded oligonucleotide or polynucleotide (ii) or a sequence therefrom.

916. (NEW) The composition of claim 914, wherein said direct or indirect attachment is through one or more nucleotides in said one strand or a sequence therefrom.

917. (NEW) The composition of claim 915, wherein said direct or indirect attachment is through one or more nucleotides in said one strand or a sequence therefrom.

918. (NEW) The composition of claim 916, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

919. (NEW) The composition of claim 917, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

920. (NEW) The composition of claim 918, wherein said bridging entity or complex is covalently or non-covalently attached.

921. (NEW) The composition of claim 919, wherein said bridging entity or complex is covalently or non-covalently attached.

922. (NEW) The composition of claim 920, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

923. (NEW) The composition of claim 921, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

924. (NEW) The composition of claim 873, wherein said signaling moiety or moieties of said chemical label or labels (iii) are covalently or non-covalently attached thereto.

925. (NEW) The composition of claim 873, wherein said signaling moiety or moieties of said chemical label or labels (iii) are directly attached thereto.

926. (NEW) The composition of claim 873, wherein said signaling moiety or moieties of said chemical label or labels (iii) are indirectly attached thereto.

927. (NEW) The composition of claim 873, wherein said chemical label or labels (iii) comprise indicator molecules.

928. (NEW) The composition of claim 927, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

929. (NEW) The composition of claim 909, wherein said chemical label or labels (iii) comprise indicator molecules.

930. (NEW) The composition of claim 929, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

931. (NEW) The composition of claim 873, wherein a quantifiable signal is generated or generatable directly or indirectly from said signaling moiety or moieties.

932. (NEW) The composition of claim 909, wherein a quantifiable signal is generated or generatable directly or indirectly from said chemical label or labels (iii).

933. (NEW) The composition of claim 873, wherein said signaling moiety or moieties are directly produced.

934. (NEW) The composition of claim 933, wherein said directly produced signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

935. (NEW) The composition of claim 873, wherein said signaling moiety or moieties are indirectly produced.

936. (NEW) The composition of claim 935, wherein said signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

937. (NEW) The composition of claim 936, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

938. (NEW) The composition of claim 909, wherein said signaling moiety or moieties are directly produced.

939. (NEW) The composition of claim 938, wherein said directly produced signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

940. (NEW) The composition of claim 909, wherein said signaling moiety or moieties are indirectly produced.

941. (NEW) The composition of claim 940, wherein said signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

942. (NEW) The composition of claim 941, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

943. (NEW) The composition of claim 873, wherein said signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagenic compound, a fluorescent compound and a chemiluminescent compound.

944. (NEW) The composition of claim 909, wherein said signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagen compound, a fluorescent compound and a chemiluminescent compound.

945. (NEW) The composition of claim 873, wherein a signal is generated or generatable from said chemical label or labels (iii) by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

946. (NEW) The composition of claim 909, wherein a signal is generated or generatable from said chemical label or labels (iii) by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

947. (NEW) The composition of claim 873, wherein said chemical label or labels (iii) are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

948. (NEW) The composition of claim 909, wherein said chemical label or labels (iii) are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

949. (NEW) The composition of claim 947, wherein said colored compound comprises a dye.

950. (NEW) The composition of claim 948, wherein said colored compound comprises a dye.

951. (NEW) The composition of claim 873, wherein a signal from said signaling moiety or moieties is quantifiable by photometric means.

952. (NEW) The composition of claim 909, wherein a signal from said signaling moiety or moieties is quantifiable by photometric means.

953. (NEW) The composition of claim 951, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

954. (NEW) The composition of claim 952, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

955. (NEW) The composition of claim 873, wherein said photometric means for quantifying (iv) are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

956. (NEW) A composition of matter comprising:

 a transparent non-porous or translucent non-porous system containing a fluid or solution, which system comprises:

 a double-stranded oligonucleotide or polynucleotide which is directly or indirectly fixed or immobilized to said transparent non-porous or translucent non-porous system;

 a chemical label or labels attached to one of said strands, said label or labels comprising a signaling entity or entities which are quantifiable in or from said fluid or solution or in or through said system, said quantity being proportional to the amount or quantity of said label or labels; and

 photometric means for quantifying said quantifiable signaling entity or entities.

957. (NEW) The composition of claim 956, wherein said transparent non-porous or translucent non-porous system is selected from the group consisting of siliceous matter and non-porous polymeric material.

958. (NEW) The composition of claim 957, wherein said siliceous matter comprises glass or a glass-coated surface.

959. (NEW) The composition of claim 958, wherein said glass or glass-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

960. (NEW) The composition of claim 959, wherein said wells comprise microtiter wells.

961. (NEW) The composition of claim 957, wherein said non-porous polymeric material comprises a plastic or plastic-coated surface.

962. (NEW) The composition of claim 961, wherein said plastic or plastic-coated surface is selected from the group consisting of polyethylene, polypropylene, polystyrene and polyepoxide.

963. (NEW) The composition of claim 961, wherein said plastic or plastic-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

964. (NEW) The composition of claim 963, wherein said wells comprise microtiter wells.

965. (NEW) The composition of claim 956, wherein said system or a portion thereof has been treated with a surface treatment agent.

966. (NEW) The composition of claim 965, wherein said surface treatment agent is selected from the group consisting of an amine compound and an epoxy compound.

967. (NEW) The composition of claim 966, wherein said surface treatment agent comprises an amine compound.

968. (NEW) The composition of claim 967, wherein said amine compound is selected from the group consisting of duodecadiamine (DDA), polylysine (PPL), γ -aminopropyltriethoxysilane, ammonium acetate and a combination of any of the foregoing.

969. (NEW) The composition of claim 966, wherein said surface treatment agent comprises an epoxy compound.

970. (NEW) The composition of claim 956, wherein at least one strand of said double-stranded oligonucleotide or polynucleotide is fixed or immobilized to said system or a portion thereof by a means selected from the group consisting of an amine compound and an epoxy compound.

971. (NEW) The composition of claim 956, wherein at least one strand of said double-stranded oligonucleotide or polynucleotide is fixed or immobilized directly or indirectly to said system or a portion thereof.

972. (NEW) The composition of claim 956, wherein said double-stranded oligonucleotide or polynucleotide is fixed or immobilized to said system or a portion thereof by sandwich hybridization.

973. (NEW) The composition of claim 956, wherein said double-stranded oligonucleotide or polynucleotide is selected from the group consisting of double-stranded nucleic acid and partially double-stranded nucleic acid.

974. (NEW) The composition of claim 956, wherein said double-stranded oligonucleotide or polynucleotide is selected from the group consisting of DNA, RNA and a DNA-RNA hybrid.

975. (Amended) The composition of claim 956, wherein one strand of said double-stranded oligonucleotide or polynucleotide or a sequence therefrom comprises a nucleic acid sequence complementary to a nucleic acid sequence of interest or sought to be quantified.

976. (NEW) The composition of claim 975, wherein said nucleic acid sequence of interest or sought to be identified or quantified or sequenced comprises a member selected from the group consisting of a gene or gene sequence, a pathogen or pathogenic sequence, an oncogene, and a combination of any of the foregoing.

977. (NEW) The composition of claim 976, wherein any of said members comprises a mutation selected from the group consisting of a deletion, an insertion, an inversion, a point mutation, and a combination of any of the foregoing.

978. (NEW) The composition of claim 975, wherein said complementary nucleic acid sequence or sequences are unlabeled.

979. (NEW) The composition of claim 956, wherein said chemical label or labels (iii) are the signaling moiety or moieties.

980. (NEW) The composition of claim 956, wherein said chemical label or labels comprise a signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said system or a portion thereof, said quantity being proportional to the amount or quantity of said label or labels.

981. (NEW) The composition of claim 979, wherein said chemical label or labels comprise a signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said system or a portion thereof, said quantity being proportional to the amount or quantity of said label or labels.

982. (NEW) The composition of claim 956, wherein said chemical label or labels are attached covalently to at least one strand of said double-stranded oligonucleotide or polynucleotide or a sequence therefrom.

983. (NEW) The composition of claim 979, wherein said chemical label or labels are attached covalently to at least one strand of said double-stranded oligonucleotide or polynucleotide or a sequence therefrom.

984. (NEW) The composition of claim 956, wherein said chemical label or labels are attached directly or indirectly to said one strand of said double-stranded oligonucleotide or polynucleotide or a sequence therefrom.

985. (NEW) The composition of claim 979, wherein said chemical label or labels are attached directly or indirectly to said one strand of said double-stranded oligonucleotide or polynucleotide or a sequence therefrom.

986. (NEW) The composition of claim 984, wherein said direct or indirect attachment is through one or more nucleotides in said one strand or a sequence therefrom.

987. (NEW) The composition of claim 985, wherein said direct or indirect attachment is through one or more nucleotides in said one strand or a sequence therefrom.

988. (NEW) The composition of claim 986, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

989. (NEW) The composition of claim 987, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

990. (NEW) The composition of claim 988, wherein said bridging entity or complex is covalently or non-covalently attached.

991. (NEW) The composition of claim 989, wherein said bridging entity or complex is covalently or non-covalently attached.

992. (NEW) The composition of claim 990, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

993. (NEW) The composition of claim 991, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

994. (NEW) The composition of claim 956, wherein said signaling moiety or moieties of said chemical label or labels are covalently or non-covalently attached thereto.

995. (NEW) The composition of claim 956, wherein said signaling moiety or moieties of said chemical label or labels are directly attached thereto.

996. (NEW) The composition of claim 956, wherein said signaling moiety or moieties of said chemical label or labels are indirectly attached thereto.

997. (NEW) The composition of claim 956, wherein said chemical label or labels comprise indicator molecules.

998. (NEW) The composition of claim 997, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

999. (NEW) The composition of claim 979, wherein said chemical label or labels comprise indicator molecules.

1000. (NEW) The composition of claim 999, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

1001. (NEW) The composition of claim 956, wherein a quantifiable signal is generated or generatable directly or indirectly from said signaling moiety or moieties.

1002. (NEW) The composition of claim 979, wherein a quantifiable signal is generated or generatable directly or indirectly from said chemical label or labels.

1003. (NEW) The composition of claim 956, wherein said signaling moiety or moieties are directly produced.

1004. (NEW) The composition of claim 1003, wherein said directly produced signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

1005. (NEW) The composition of claim 956, wherein said signaling moiety or moieties are indirectly produced.

1006. (NEW) The composition of claim 1005, wherein said signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

1007. (NEW) The composition of claim 1006, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

1008. (NEW) The composition of claim 979, wherein said signaling moiety or moieties are directly produced.

1009. (NEW) The composition of claim 1008, wherein said directly produced signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

1010. (NEW) The composition of claim 979, wherein said signaling moiety or moieties are indirectly produced.

1011. (NEW) The composition of claim 1010, wherein said signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

1012. (NEW) The composition of claim 1011, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

1013. (NEW) The composition of claim 956, wherein said signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagenic compound, a fluorescent compound and a chemiluminescent compound.

1014. (NEW) The composition of claim 979, wherein said signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagen compound, a fluorescent compound and a chemiluminescent compound.

1015. (NEW) The composition of claim 956, wherein a signal is generated or generatable from said chemical label or labels by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

1016. (NEW) The composition of claim 979, wherein a signal is generated or generatable from said chemical label or labels by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

1017. (NEW) The composition of claim 873, wherein said chemical label or labels are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

1018. (NEW) The composition of claim 979, wherein said chemical label or labels are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

1019. (NEW) The composition of claim 1017, wherein said colored compound comprises a dye.

1020. (NEW) The composition of claim 1018, wherein said colored compound comprises a dye.

1021. (NEW) The composition of claim 956, wherein a signal from said signaling moiety or moieties is quantifiable by photometric means.

1022. (NEW) The composition of claim 979, wherein a signal from said signaling moiety or moieties is quantifiable by photometric means.

1023. (NEW) The composition of claim 1021, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1024. (NEW) The composition of claim 1022, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1025. (NEW) The composition of claim 956, wherein said photometric means for quantifying (iv) are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1026. (NEW) The composition of claim 956, wherein said photometric means for quantifying are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1027. (NEW) A transparent non-porous or translucent non-porous system containing a fluid or solution, which system comprises:

- (i) a double-stranded nucleic acid comprising an oligonucleotide or polynucleotide hybridized or hybridizable to an oligo- or polynucleotide sequence;
- (ii) a chemical label or labels attached to one of said strands, said chemical label or labels comprising a signaling entity or entities which are quantifiable in or from said fluid or solution or in or through said system, said quantity being proportional to the amount or quantity of said label or labels;
- (iii) a solid support contained within said transparent non-porous or translucent non-porous system, said solid support having directly or indirectly fixed or immobilized thereto said oligo- or polynucleotide sequence or said oligonucleotide or polynucleotide (i), and
- (iv) photometric means for quantifying said quantifiable signaling entity or entities.

1028. (NEW) The system of claim 1027, wherein said transparent non-porous or translucent non-porous system is selected from the group consisting of siliceous matter and non-porous polymeric material.

1029. (Amended) The system of claim 1028, wherein said siliceous matter comprises glass or a glass-coated surface.

1030. (NEW) The system of claim 1029, wherein said glass or glass-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

1031. (NEW) The system of claim 1030, wherein said wells comprise microtiter wells.

1032. (NEW) The system of claim 1028, wherein said non-porous polymeric material comprises a plastic or plastic-coated surface.

1033. (NEW) The system of claim 1032, wherein said plastic or plastic-coated surface is selected from the group consisting of polyethylene, polypropylene, polystyrene and polyepoxide.

1034. (NEW) The system of claim 1032, wherein said plastic or plastic-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

1035. (NEW) The system of claim 1034, wherein said wells comprise microtiter wells.

1036. (NEW) The system of claim 1027, wherein said solid support (iii) is selected from the group consisting of a porous solid support and a non-porous solid support.

1037. (NEW) The system of claim 1036, wherein said porous solid support (iii) comprises a porous polymeric material.

1038. (NEW) The system of claim 1037, wherein said porous polymeric material is selected from the group consisting of dextran and nitrocellulose.

1039. (NEW) The system of claim 1037, wherein said porous polymeric material comprises porous glass.

1040. (NEW) The system of claim 1036, wherein said non-porous solid support (iii) is selected from the group consisting of siliceous matter and non-porous polymeric material.

1041. (NEW) The system of claim 1040, wherein said siliceous matter comprises glass or a glass-coated surface.

1042. (NEW) The system of claim 1041, wherein said glass or glass-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

1043. (NEW) The system of claim 1042, wherein said wells comprise microtiter wells.

1044. (NEW) The system of claim 1040, wherein said non-porous polymeric material comprises a plastic or plastic-coated surface.

1045. (NEW) The system of claim 1044, wherein said plastic or plastic-coated surface is selected from the group consisting of polyethylene, polypropylene, polystyrene and polyepoxide.

1046. (NEW) The system of claim 1044, wherein said plastic or plastic-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

1047. (NEW) The system of claim 1046, wherein said wells comprise microtiter wells.

1048. (NEW) The system of claim 1036, wherein said non-porous solid support is transparent or translucent.

1049. (NEW) The system of claim 1027, wherein said solid support (iii) or a portion thereof has been treated with a surface treatment agent.

1050. (NEW) The system of claim 1049, wherein said surface treatment agent is selected from the group consisting of an amine compound and an epoxy compound.

1051. (NEW) The system of claim 1050, wherein said surface treatment agent comprises an amine compound.

1052. (NEW) The system of claim 1051, wherein said amine compound is selected from the group consisting of duodecadiamine (DDA), polylysine (PPL), γ -aminopropyltriethoxysilane, ammonium acetate and a combination of any of the foregoing.

1053. (NEW) The system of claim 1050, wherein said surface treatment agent comprises an epoxy compound.

1054. (NEW) The system of claim 1027, wherein at least one strand of said double-stranded oligonucleotide or polynucleotide (i) is fixed or immobilized to said solid support (iii) by a means selected from the group consisting of an amine compound and an epoxy compound.

1055. (NEW) The system of claim 1027, wherein at least one strand of said double-stranded oligonucleotide or polynucleotide (i) is fixed or immobilized directly or indirectly to said solid support (iii).

1056. (NEW) The system of claim 1027, wherein said double-stranded oligonucleotide or polynucleotide (i) is fixed or immobilized to said solid support (iii) by sandwich hybridization.

1057. (NEW) The system of claim 1027, wherein said double-stranded oligonucleotide or polynucleotide (i) is selected from the group consisting of double-stranded nucleic acid and partially double-stranded nucleic acid.

1058. (NEW) The system of claim 1027, wherein said double-stranded oligonucleotide or polynucleotide (i) is selected from the group consisting of DNA, RNA and a DNA-RNA hybrid.

1059. (NEW) The system of claim 1027, wherein one strand of said double-stranded oligonucleotide or polynucleotide (i) or a sequence therefrom comprises a nucleic acid sequence complementary to a nucleic acid sequence of interest or sought to be quantified.

1060. (NEW) The system of claim 1059, wherein said nucleic acid sequence of interest or sought to be quantified comprises a member selected from the group consisting of a gene or gene sequence, a pathogen or pathogenic sequence, an oncogene, and a combination of any of the foregoing.

1061. (NEW) The system of claim 1060, wherein any of said members comprises a mutation selected from the group consisting of a deletion, an insertion, an inversion, a point mutation, and a combination of any of the foregoing.

1062. (NEW) The system of claim 1059, wherein said complementary nucleic acid sequence or sequences are unlabeled.

1063. (NEW) The system of claim 1027, wherein said chemical label or labels (ii) are the signaling moiety or moieties.

1064. (NEW) The system of claim 1027, wherein said chemical label or labels (ii) comprise a signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said system or said solid support (i) or a collection or set of said solid supports (iii), said quantity being proportional to the amount or quantity of said label or labels.

1065. (NEW) The system of claim 1063, wherein said chemical label or labels (ii) comprise a signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said system or said solid support (iii) or a collection or set of said solid supports (iii), said quantity being proportional to the amount or quantity of said label or labels.

1066. (NEW) The system of claim 1027, wherein said chemical label or labels (ii) are attached covalently to at least one strand of said double-stranded oligonucleotide or polynucleotide (i) or a sequence therefrom.

1067. (NEW) The system of claim 1063, wherein said chemical label or labels (ii) are attached covalently to at least one strand of said double-stranded oligonucleotide or polynucleotide (i) or a sequence therefrom.

1068. (NEW) The system of claim 1027, wherein said chemical label or labels (ii) are attached directly or indirectly to said one strand of said double-stranded oligonucleotide or polynucleotide (i) or a sequence therefrom.

1069. (NEW) The system of claim 1063, wherein said chemical label or labels (ii) are attached directly or indirectly to said one strand of said double-stranded oligonucleotide or polynucleotide (i) or a sequence therefrom.

1070. (NEW) The system of claim 1068, wherein said direct or indirect attachment is through one or more nucleotides in said one strand or a sequence therefrom.

1071. (NEW) The system of claim 1069, wherein said direct or indirect attachment is through one or more nucleotides in said one strand or a sequence therefrom.

1072. (NEW) The system of claim 1070, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

1073. (NEW) The system of claim 1071, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

1074. (NEW) The system of claim 1072, wherein said bridging entity or complex is covalently or non-covalently attached.

1075. (NEW) The system of claim 1073, wherein said bridging entity or complex is covalently or non-covalently attached.

1076. (NEW) The system of claim 1072, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

1077. (NEW) The system of claim 1073, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

1078. (NEW) The system of claim 1027, wherein said signaling moiety or moieties of said chemical label or labels (ii) are covalently or non-covalently attached thereto.

1079. (NEW) The system of claim 1027, wherein said signaling moiety or moieties of said chemical label or labels (ii) are directly attached thereto.

1080. (NEW) The system of claim 1027, wherein said signaling moiety or moieties of said chemical label or labels (ii) are indirectly attached thereto.

1081. (NEW) The system of claim 1027, wherein said chemical label or labels (ii) comprise indicator molecules.

1082. (NEW) The system of claim 1081, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

1083. (NEW) The system of claim 1063, wherein said chemical label or labels (ii) comprise indicator molecules.

1084. (NEW) The system of claim 1083, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

1085. (NEW) The system of claim 1027, wherein a quantifiable signal is generated or generatable directly or indirectly from said signaling moiety or moieties.

1086. (NEW) The system of claim 1063, wherein a quantifiable signal is generated or generatable directly or indirectly from said chemical label or labels (ii).

1087. (NEW) The system of claim 1027, wherein said signaling moiety or moieties are directly produced.

1088. (NEW) The system of claim 1087, wherein said directly produced signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

1089. (NEW) The system of claim 1027, wherein said signaling moiety or moieties are indirectly produced.

1090. (NEW) The system of claim 1089, wherein said signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

1091. (NEW) The system of claim 1090, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

1092. (NEW) The system of claim 1063, wherein said signaling moiety or moieties are directly produced.

1093. (NEW) The system of claim 1092, wherein said directly produced signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

1094. (NEW) The system of claim 1063, wherein said signaling moiety or moieties are indirectly produced.

1095. (NEW) The system of claim 1094, wherein said signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

1096. (NEW) The system of claim 1095, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

1097. (NEW) The system of claim 1027, wherein said signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagenic compound, a fluorescent compound and a chemiluminescent compound.

1098. (NEW) The system of claim 1063, wherein said signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagen compound, a fluorescent compound and a chemiluminescent compound.

1099. (NEW) The system of claim 1027, wherein a signal is generated or generatable from said chemical label or labels (ii) by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

1100. (NEW) The system of claim 1063, wherein a signal is generated or generatable from said chemical label or labels (ii) by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

1101. (NEW) The system of claim 1027, wherein said chemical label or labels (ii) are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

1102. (NEW) The system of claim 1063, wherein said chemical label or labels (iii) are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

1103. (NEW) The system of claim 1101, wherein said colored compound comprises a dye.

1104. (NEW) The system of claim 1102, wherein said colored compound comprises a dye.

1105. (NEW) The system of claim 1027, wherein a signal from said signaling moiety or moieties is quantifiable by photometric means.

1106. (NEW) The system of claim 1063, wherein a signal from said chemical label or labels (ii) is quantifiable by photometric means.

1107. (NEW) The system of claim 1105, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1108. (NEW) The system of claim 1106, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1109. (NEW) The system of claim 1107, wherein said photometric means for quantifying (iv) are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1110. (NEW) The system of claim 1027, wherein said photometric means for quantifying are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1111. (NEW) A composition of matter comprising a plurality of substrate surfaces, each substrate surface comprising at least one double-stranded nucleic acid fixed or immobilized thereto, wherein at least one nucleic acid strand or a sequence therefrom comprises one or more non-radioactive chemical labels which comprise a non-radioactive signaling moiety or moieties which are quantifiable or detectable, and wherein at least one nucleic acid strand or a sequence therefrom in one of said substrate surfaces is different from at least one other nucleic acid strand or a sequence therefrom in another substrate surface.

1112. (NEW) The composition of matter of claim 1111, wherein said substrate surfaces or surface is selected from the group consisting of a porous substrate surface and a non-porous substrate surface.

1113. (NEW) The composition of matter of claim 1112, wherein said porous substrate surface comprises a porous polymeric material.

1114. (NEW) The composition of matter of claim 1113, wherein said porous polymeric material is selected from the group consisting of dextran and nitrocellulose.

1115. (NEW) The composition of matter of claim 1113, wherein said porous polymeric material comprises porous glass.

1116. (NEW) The composition of matter of claim 1112, wherein said non-porous substrate surface is selected from the group consisting of siliceous matter and non-porous polymeric material.

1117. (NEW) The composition of matter of claim 1116, wherein said siliceous matter comprises glass or a glass-coated surface.

1118. (NEW) The composition of matter of claim 1117, wherein said glass or glass-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

1119. (NEW) The composition of matter of claim 1118, wherein said wells comprise microtiter wells.

1120. (NEW) The composition of matter of claim 1116, wherein said non-porous polymeric material comprises a plastic or plastic-coated surface.

1121. (NEW) The composition of matter of claim 1120, wherein said plastic or plastic-coated surface is selected from the group consisting of polyethylene, polypropylene, polystyrene and polyepoxide.

1122. (NEW) The composition of matter of claim 1120, wherein said plastic or plastic-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

1123. (NEW) The composition of matter of claim 1122, wherein said wells comprise microtiter wells.

1124. (NEW) The composition of matter of claim 1111, wherein said substrate surface or surfaces have been treated with a surface treatment agent.

1125. (NEW) The composition of matter of claim 1124, wherein said surface treatment agent is selected from the group consisting of an amine compound and an epoxy compound.

1126. (NEW) The composition of matter of claim 1125, wherein said surface treatment agent comprises an amine compound.

1127. (NEW) The composition of matter of claim 1126, wherein said amine compound is selected from the group consisting of duodecadiamine (DDA), polylysine (PPL), γ -aminopropyltriethoxysilane, ammonium acetate and a combination of any of the foregoing.

1128. (NEW) The composition of matter of claim 1125, wherein said surface treatment agent comprises an epoxy compound.

1129. (NEW) The composition of matter of claim 1111, wherein said at least one nucleic acid strand or a sequence therefrom has been fixed or immobilized to said substrate surface or surfaces by a means selected from the group consisting of an amine compound and an epoxy compound.

1130. (NEW) The composition of matter of claim 1111, wherein said at least one nucleic acid strand or a sequence therefrom has been fixed or immobilized directly or indirectly to said substrate surface or surfaces.

1131. (NEW) The composition of matter of claim 1111, wherein one strand of each of said double-stranded nucleic acid strands is fixed or immobilized directly or indirectly to said substrate surface or surfaces.

1132. (NEW) The composition of matter of claim 1111, wherein said double-stranded nucleic acid strands are fixed or immobilized to said substrate surfaces by sandwich hybridization.

1133. (NEW) The composition of matter of claim 1111, wherein said nucleic acid strands are selected from the group consisting of single-stranded nucleic acid, double-stranded nucleic acid and partially double-stranded nucleic acid.

1134. (NEW) The composition of matter of claim 1111, wherein said nucleic acid strands are selected from the group consisting of DNA, RNA and a DNA-RNA hybrid.

1135. (NEW) The composition of matter of claim 1111, wherein said at least one nucleic acid strand or a sequence therefrom comprises a nucleic acid sequence complementary to a nucleic acid sequence of interest or sought to be identified or quantified or sequenced.

1136. (NEW) The composition of matter of claim 1135, wherein said nucleic acid sequence of interest or sought to be identified or quantified or sequenced comprises a member selected from the group consisting of a gene or gene sequence; a pathogen or pathogenic sequence, an oncogene, and a combination of any of the foregoing.

1137. (NEW) The composition of matter of claim 1136, wherein any of said members comprises a mutation selected from the group consisting of a deletion, an insertion, an inversion, a point mutation, and a combination of any of the foregoing.

1138. (NEW) The composition of matter of claim 1135, wherein said complementary nucleic acid sequence or sequences are unlabeled.

1139. (NEW) The composition of matter of claim 1111, wherein said non-radioactive chemical label or labels are the non-radioactive signaling moiety or moieties.

1140. (NEW) The composition of matter of claim 1111, wherein said non-radioactive chemical label or labels comprise a non-radioactive signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said composition of matter or said substrate surfaces or a system or collection or set containing said substrate surfaces, said quantity being proportional to the amount or quantity of said label or labels.

1141. (NEW) The composition of matter of claim 1139, wherein said non-radioactive chemical label or labels comprise a non-radioactive signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said composition of matter or said substrate surfaces or a system or collection or set containing said substrate surfaces, said quantity being proportional to the amount or quantity of said label or labels.

1142. (NEW) The composition of matter of claim 1111, wherein said non-radioactive chemical label or labels are attached covalently to said at least one nucleic acid strand or a sequence therefrom.

1143. (NEW) The composition of matter of claim 1139, wherein said non-radioactive chemical label or labels are attached covalently to said at least one nucleic acid strand or a sequence therefrom.

1144. (NEW) The composition of matter of claim 1111, wherein said non-radioactive chemical label or labels are attached directly or indirectly to said at least one nucleic acid strand or a sequence therefrom.

1145. (NEW) The composition of matter of claim 1139, wherein said non-radioactive chemical label or labels are attached directly or indirectly to said at least one nucleic acid strand or a sequence therefrom.

1146. (NEW) The composition of matter of claim 1144, wherein said direct or indirect attachment is through one or more nucleotides in said at least one nucleic acid strand or a sequence therefrom.

1147. (NEW) The composition of matter of claim 1145, wherein said direct or indirect attachment is through one or more nucleotides in said at least one nucleic acid strand or a sequence therefrom.

1148. (NEW) The composition of matter of claim 1146, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

1149. (NEW) The composition of matter of claim 1147, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

1150. (NEW) The composition of matter of claim 1148, wherein said bridging entity or complex is covalently or non-covalently attached.

1151. (NEW) The composition of matter of claim 1149, wherein said bridging entity or complex is covalently or non-covalently attached.

1152. (NEW) The composition of matter of claim 1150, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

1153. (NEW) The composition of matter of claim 1151, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

1154. (NEW) The composition of matter of claim 1111, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are covalently or non-covalently attached thereto.

1155. (NEW) The composition of matter of claim 1111, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are directly attached thereto.

1156. (NEW) The composition of matter of claim 1111, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are indirectly attached thereto.

1157. (NEW) The composition of matter of claim 1111, wherein said non-radioactive chemical label or labels comprise indicator molecules.

1158. (NEW) The composition of matter of claim 1157, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

1159. (NEW) The composition of matter of claim 1139, wherein said non-radioactive chemical label or labels comprise indicator molecules.

1160. (NEW) The composition of matter of claim 1159, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

1161. (NEW) The composition of matter of claim 1111, wherein a quantifiable or detectable non-radioactive signal is generated or generatable directly or indirectly from said non-radioactive signaling moiety or moieties.

1162. (NEW) The composition of matter of claim 1139, wherein a quantifiable or detectable non-radioactive signal is generated or generatable directly or indirectly from said non-radioactive chemical label or labels.

1163. (NEW) The composition of matter of 1111, wherein said non-radioactive signaling moiety or moieties are directly produced.

1164. (NEW) The composition of matter of claim 1163, wherein said directly produced non-radioactive signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

1165. (NEW) The composition of matter of 1111, wherein said non-radioactive signaling moiety or moieties are indirectly produced.

1166. (NEW) The composition of matter of claim 1165, wherein said non-radioactive signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

1167. (NEW) The composition of matter of claim 1166, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

1168. (NEW) The composition of matter of 1139, wherein said non-radioactive signaling moiety or moieties are directly produced.

1169. (NEW) The composition of matter of claim 1168, wherein said directly produced non-radioactive signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

1170. (NEW) The composition of matter of 1139, wherein said non-radioactive signaling moiety or moieties are indirectly produced.

1171. (NEW) The composition of matter of claim 1170, wherein said non-radioactive signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

1172. (NEW) The composition of matter of claim 1171, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

1173. (NEW) The composition of matter of claim 1111, wherein said non-radioactive signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagenic compound, a fluorescent compound and a chemiluminescent compound.

1174. (NEW) The composition of matter of claim 1139, wherein said non-radioactive signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagen compound, a fluorescent compound and a chemiluminescent compound.

1175. (NEW) The composition of matter of claim 1111, wherein a non-radioactive signal is generated or generatable from said non-radioactive chemical label or labels by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

1176. (NEW) The composition of matter of claim 1139, wherein a non-radioactive signal is generated or generatable from said non-radioactive chemical label or labels by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

1177. (NEW) The composition of matter of claim 1111, wherein said non-radioactive chemical label or labels are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

1178. (NEW) The composition of matter of claim 1139, wherein said non-radioactive chemical label or labels are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

1179. (NEW) The composition of matter of claim 1178, wherein said colored compound comprises a dye.

1180. (NEW) The composition of matter of claim 1178, wherein said colored compound comprises a dye.

1181. (NEW) The composition of matter of claim 1111, wherein a non-radioactive signal from said non-radioactive signaling moiety or moieties is quantifiable or detectable by photometric means.

1182. (NEW) The composition of matter of claim 1139, wherein a non-radioactive signal from said non-radioactive signaling moiety or moieties is quantifiable or detectable by photometric means.

1183. (NEW) The composition of matter of claim 1181, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1184. (NEW) The composition of matter of claim 1182, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1185. (NEW) The composition of matter of claim 1111, wherein said substrate surface is transparent or translucent.

1186. (NEW) The composition of matter of claim 1112, wherein said substrate surface is transparent or translucent.

1187. (NEW) A collection or set comprising the substrate surfaces of any of claims 1111 to 1186.

1188. (NEW) A collection or set comprising the substrate surfaces of claim 1111, wherein said substrate surfaces are porous.

1189. (NEW) A collection or set comprising the substrate surfaces of claim 1111, wherein said substrate surfaces are non-porous.

1190. (NEW) The collection or set of claim 1189, wherein said non-porous substrate surfaces are transparent or translucent.

1191. (NEW) A non-porous system for retaining or containing a fluid or solution, which system comprises the substrate surfaces of any of claims 1111-1186.

1192. (NEW) A non-porous system for retaining or containing a fluid or solution, which system comprises a collection or set of any of the substrate surfaces of claims 1111-1186.

1193. (NEW) A composition of matter comprising a plurality of non-porous substrate surfaces, each non-porous substrate surface comprising at least one nucleic acid strand fixed or immobilized thereto, and wherein at least one nucleic acid strand or a sequence therefrom in one of said non-porous substrate surfaces is different from at least one other nucleic acid strand or a sequence therefrom in another non-porous substrate surface.

1194. (NEW) The composition of matter of claim 1193, wherein said non-porous substrate surface or surfaces are selected from the group consisting of siliceous matter and non-porous polymeric material.

1195. (NEW) The composition of matter of claim 1194, wherein said siliceous matter comprises glass or a glass-coated surface.

1196. (NEW) The composition of matter of claim 1195, wherein said glass or glass-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection or set of said plates, wells, depressions, tubes or cuvettes.

1197. (NEW) The composition of matter of claim 1196, wherein said wells comprise microtiter wells.

1198. (NEW) The composition of matter of claim 1194, wherein said non-porous polymeric material comprises a plastic or plastic-coated surface.

1199. (NEW) The composition of matter of claim 1198, wherein said plastic or plastic-coated surface is selected from the group consisting of polyethylene, polypropylene, polystyrene and polyepoxide.

1200. (NEW) The composition of matter of claim 1198, wherein said plastic or plastic-coated surface is selected from the group consisting of plates, wells, depressions, tubes, cuvettes and a collection of said plates, wells, depressions, tubes or cuvettes.

1201. (NEW) The composition of matter of claim 1200, wherein said wells comprise microtiter wells.

1202. (NEW) The composition of matter of claim 1193, wherein said non-porous substrate surface or surfaces have been treated with a surface treatment agent.

1203. (NEW) The composition of matter of claim 1202, wherein said surface treatment agent is selected from the group consisting of an amine compound and an epoxy compound.

1204. (NEW) The composition of matter of claim 1203, wherein said surface treatment agent comprises an amine compound.

1205. (NEW) The composition of matter of claim 1204, wherein said amine compound is selected from the group consisting of duodecadiamine (DDA), polylysine (PPL), γ -aminopropyltriethoxysilane, ammonium acetate and a combination of any of the foregoing.

1206. (NEW) The composition of matter of claim 1203, wherein said surface treatment agent comprises an epoxy compound.

1207. (NEW) The composition of matter of claim 1193, wherein said at least one nucleic acid strand or a sequence therefrom has been fixed or immobilized to said non-porous substrate surface or surfaces by a means selected from the group consisting of an amine compound and an epoxy compound.

1208. (NEW) The composition of matter of claim 1193, wherein said at least one nucleic acid strand or a sequence therefrom has been fixed or immobilized directly or indirectly to said non-porous substrate surface or surfaces.

1209. (NEW) The composition of matter of claim 1193, wherein said nucleic acid strands are selected from the group consisting of single-stranded nucleic acid and partially double-stranded nucleic acid.

1210. (NEW) The composition of matter of claim 1193, wherein said nucleic acid strands are selected from the group consisting of DNA and RNA.

1211. (NEW) The composition of matter of claim 1193, wherein said at least one nucleic acid strand or a sequence therefrom comprises a nucleic acid sequence complementary to a nucleic acid sequence of interest or sought to be identified or quantified or sequenced.

1212. (NEW) The composition of matter of claim 1211, wherein said nucleic acid sequence of interest or sought to be identified or quantified or sequenced comprises a member selected from the group consisting of a gene or gene sequence, a pathogen or pathogenic sequence, an oncogene, and a combination of any of the foregoing.

1213. (NEW) The composition of matter of claim 1212, wherein any of said members comprises a mutation selected from the group consisting of a deletion, an insertion, an inversion, a point mutation, and a combination of any of the foregoing.

1214. (NEW) The composition of matter of claim 1211, wherein said nucleic acid sequence of interest or sought to be identified or quantified or sequenced comprises one or more non-radioactive chemical labels which comprise a non-radioactive signaling moiety or moieties which are quantifiable or detectable.

1215. (NEW) The composition of matter of claim 1214, wherein said non-radioactive chemical label or labels are the non-radioactive signaling moiety or moieties.

1216. (NEW) The composition of matter of claim 1214, wherein said non-radioactive chemical label or labels comprise a non-radioactive signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said composition of matter or said non-porous substrate surfaces or a system or collection or set containing said non-porous substrate surfaces, said quantity being proportional to the amount or quantity of said label or labels.

1217. (NEW) The composition of matter of claim 1215, wherein said non-radioactive chemical label or labels comprise a non-radioactive signaling moiety or moieties which are quantifiable in or from a fluid or solution or in or through said composition of matter or said non-porous substrate surfaces or a system or collection or set containing said non-porous substrate surfaces, said quantity being proportional to the amount or quantity of said label or labels.

1218. (NEW) The composition of matter of claim 1214, wherein said non-radioactive chemical label or labels are attached covalently to said at least one nucleic acid strand or a sequence therefrom.

1219. (NEW) The composition of matter of claim 1215, wherein said non-radioactive chemical label or labels are attached covalently to said at least one nucleic acid strand or a sequence therefrom.

1220. (NEW) The composition of matter of claim 1214, wherein said non-radioactive chemical label or labels are attached directly or indirectly to said at least one nucleic acid strand or a sequence therefrom.

1221. (NEW) The composition of matter of claim 1215, wherein said non-radioactive chemical label or labels are attached directly or indirectly to said at least one nucleic acid strand or a sequence therefrom.

1222. (NEW) The composition of matter of claim 1220, wherein said direct or indirect attachment is through one or more nucleotides in said at least one nucleic acid strand or a sequence therefrom.

1223. (NEW) The composition of matter of claim 1221, wherein said direct or indirect attachment is through one or more nucleotides in said at least one nucleic acid strand or a sequence therefrom.

1224. (NEW) The composition of matter of claim 1222, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

1225. (NEW) The composition of matter of claim 1223, wherein said attachment is indirectly through a bridging entity or a formation of a complex.

1226. (NEW) The composition of matter of claim 1224, wherein said bridging entity or complex is covalently or non-covalently attached.

1227. (NEW) The composition of matter of claim 1225, wherein said bridging entity or complex is covalently or non-covalently attached.

1228. (NEW) The composition of matter of claim 1226, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

1229. (NEW) The composition of matter of claim 1227, wherein said bridging entity or complex is selected from the group consisting of biotin and avidin, biotin and streptavidin, a sugar and a lectin, and an antigen and an antibody.

1230. (NEW) The composition of matter of claim 1214, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are covalently or non-covalently attached thereto.

1231. (NEW) The composition of matter of claim 1214, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are directly attached thereto.

1232. (NEW) The composition of matter of claim 1214, wherein said non-radioactive signaling moiety or moieties of said non-radioactive chemical label or labels are indirectly attached thereto.

1233. (NEW) The composition of matter of claim 1214, wherein said non-radioactive chemical label or labels comprise indicator molecules.

1234. (NEW) The composition of matter of claim 1233, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

1235. (NEW) The composition of matter of claim 1215, wherein said non-radioactive chemical label or labels comprise indicator molecules.

1236. (NEW) The composition of matter of claim 1235, wherein said indicator molecules are selected from the group consisting of a chromagenic compound, a fluorescent compound, a chemiluminescent compound and a combination of any of the foregoing.

1237. (NEW) The composition of matter of claim 1214, wherein a quantifiable or detectable non-radioactive signal is generated or generatable directly or indirectly from said non-radioactive signaling moiety or moieties.

1238. (NEW) The composition of matter of claim 1215, wherein a quantifiable or detectable non-radioactive signal is generated or generatable directly or indirectly from said non-radioactive chemical label or labels.

1239. (NEW) The composition of matter of 1214, wherein said non-radioactive signaling moiety or moieties are directly produced.

1240. (NEW) The composition of matter of claim 1239, wherein said directly produced non-radioactive signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

1248. (NEW) The composition of matter of claim 1247, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

1249. (NEW) The composition of matter of claim 1214, wherein said non-radioactive signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagenic compound, a fluorescent compound and a chemiluminescent compound.

1250. (NEW) The composition of matter of claim 1215, wherein said non-radioactive signaling moiety or moieties are selected from the group consisting of an enzyme, a co-enzyme, a chelating compound, a chromagen compound, a fluorescent compound and a chemiluminescent compound.

1251. (NEW) The composition of matter of claim 1214, wherein a non-radioactive signal is generated or generatable from said non-radioactive chemical label or labels by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

1252. (NEW) The composition of matter of claim 1215, wherein a non-radioactive signal is generated or generatable from said non-radioactive chemical label or labels by a means selected from the group consisting of chromagenic means, fluorescent means and chemiluminescent means.

1253. (NEW) The composition of matter of claim 1214, wherein said non-radioactive chemical label or labels are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

1241. (NEW) The composition of matter of 1214, wherein said non-radioactive signaling moiety or moieties are indirectly produced.

1242. (NEW) The composition of matter of claim 1241, wherein said non-radioactive signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

1243. (NEW) The composition of matter of claim 1242, wherein said enzyme is selected from the group consisting of alkaline phosphatase, acid phosphatase, peroxidase, β -D-galactosidase and glucose oxidase.

1244. (NEW) The composition of matter of 1215, wherein said non-radioactive signaling moiety or moieties are directly produced.

1245. (NEW) The composition of matter of claim 1244, wherein said directly produced non-radioactive signaling moiety or moieties comprise a member selected from the group consisting of a chromagen, a fluorogen and chemiluminescent compound.

1246. (NEW) The composition of matter of 1215, wherein said non-radioactive signaling moiety or moieties are indirectly produced.

1247. (NEW) The composition of matter of claim 1246, wherein said non-radioactive signaling moiety or moieties are indirectly produced by an enzyme or enzymatic reaction.

1254. (NEW) The composition of matter of claim 1215, wherein said non-radioactive chemical label or labels are selected from the group consisting of a colored compound, a chemiluminescent compound and a fluorescent compound.

1255. (NEW) The composition of matter of claim 1253, wherein said colored compound comprises a dye.

1256. (NEW) The composition of matter of claim 1254, wherein said colored compound comprises a dye.

1257. (NEW) The composition of matter of claim 1214, wherein a non-radioactive signal from said non-radioactive signaling moiety or moieties is quantifiable or detectable by photometric means.

1258. (NEW) The composition of matter of claim 1215, wherein a non-radioactive signal from said non-radioactive chemical label or labels is quantifiable or detectable by photometric means.

1259. (NEW) The composition of matter of claim 1257, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1260. (NEW) The composition of matter of claim 1258, wherein said photometric means are selected from the group consisting of photometric techniques, spectrophotometric techniques, colorimetric techniques, fluorometric techniques and chemiluminescent techniques.

1261. (NEW) The composition of matter of claim 1193, wherein said non-porous substrate surface or surfaces are transparent or translucent.

1262. (NEW) A collection or set comprising the non-porous substrate surfaces of any of claims 1193 to 1261.

1263. (NEW) A collection or set comprising the non-porous substrate surfaces of claim 1193, wherein said non-porous substrate surfaces are transparent or translucent.

1264. (NEW) A non-porous system for retaining or containing a fluid or solution, which system comprises the non-porous substrate surfaces of any of claims 1193-1261.

1265. (NEW) A non-porous system for retaining or containing a fluid or solution, which system comprises a collection or set of any of the non-porous substratae surfaces of claims 1193-1261.

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